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ABSTRACT

To facilitate college and university officials in financing the eduational needs of the nontraditional students, a method for collecting and determining the cost of providing units of instruction through various delivery mechanisms available to colleges and universities is presented. Twelve ways of delivering instructional units, eight types of costs incurred in the providing of instructional units, and six levels of instruction are identified. The costing model and its use are described. (SPG)

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A COSTING MODEL

FOR NCN TRADITIONAL EDUCATION

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A COSTING MODEL FOR NON-TRADITIONAL EDUCATION

At present national attention is being focused on extending higher educational opportunities to all citizens. This attention is due to: 1. the increase in the number of part-time students and potential part-time students, and 2. the leveling-off and projected decrease in the number of traditional full-time students attending institutions of higher education. A recent study by the American Council on Education's Committee on the Financing of Higher Education for Adult Students found that, "In 1972, for the first time in American history, approximately half of the students (degree credit, non-degree credit, and non-credit) in collegiate institutions of higher education participated on a part-time basis. Further the study indicated that the rate of increase in the numbers of collegiate part-time students between 1969 and 1972 was 3.5 times as great as for the full-time students.

An analysis of the census data indicates that the recent decrease in enrollments is partly attributable to a reduction in the percent of high school graduates who attend college. Census Bureau data show that the college-going rate has returned to the 1962 rate which was about 47 percent of high school graduates and 31 percent of 18-21 year-olds. Even though the rate of college-going high school graduates has declined, the number of 18-21 year-olds has increased by 1 million in the past three years. Further, the 18-21 year-old is expected to increase by another million to 17.1 million by 1980. However, by 1984 the number of 18-21 year-olds will decrease to 16.1 million and by 1992 to 13.2 million. Between 1984 and 1992 there will be a 21 percent drop in the number of 18-21 year-olds.

As enrollments level or drop, colleges and universities seek new constituencies to serve. One likely target populations are adult learners. A recent survey of college presidents indicated that 28 percent will do more extensive recruiting for adults over 22, 26 percent will do more recruiting for evening students, 22 percent will do more recruiting for off-campus students, 20 percent will do more for early admittees from high school, 19 percent will do more for transfer students, and 17 percent will do more for previous drop-outs. An examination of these facts indicates that the emphasis in the future will be on the adult student and on those students attending colleges and universities at times and at locations different from those of the traditional on-campus student. In the same survey of college and university presidents, it was reported that over half the respondents indicated an increase in programming for adult, evening, and off-campus students. By 1980, three-fourths of the respondents expect a wider array of offerings for adult, off-campus, and evening students.

A major problem confronting college and university officials is the financing of these educational needs for the non-traditional programs. Most of the direct costs of extension, non-credit, and off-campus courses must be paid by the student. Many state funding formulas do not take into account the costs of providing non-traditional forms of education to these non-traditional students. In most cases these offerings are indirectly subsidized by the institution which provides the support services such as registration, bursar, business office, and other administrative services. Current approaches to state funding of higher education are based on discipline costs for the traditional full-time student. The costing procedures being developed by NCHEMS and some state commissions of higher education are not

sophisticated enough to handle the different cost structures for the various types of non-traditional offerings. For instance, most costing models assume that the costs for the various support services are functions of the number of full-time equivalent students. For some services, this may be true; however, the costs of providing counseling, financial aid, placement, admissions, registration and records, business office, and academic advising services are more a function of the total number of students and not their full-time equivalency.

Another problem in the area of non-traditional education is that most costing and funding approaches consider only credit offerings. Only one state, Georgia, provides funding for non-credit continuing educations units. Another major problem with costing models is that they do not take into account the different cost structures associated with the various delivery systems such as off-campus instruction, T.V., radio and evening courses. Partly because of the lack of financial data on non-traditional forms of education and partly, I am sure, because of the inadequacy of the current funding and costing procedures, the Commission on Non-traditional Study has recommended that, "Studies should be undertaken to get definitive answers to such questions as: (a) cost-per-student for providing units of instruction by various non-traditional methods: (b) cost-per-student and cost-per-program on non-traditional programs compared with traditional education."

The purpose of this paper is to present a method for collecting and determining the cost of providing units of instruction through the various delivery mechanisms available to colleges and universities. The basic premise of this model is that the cost of providing instructional units is a function of the delivery system, the services of the institution required in delivering the instruction, and the level of the instruction.

Twelve ways of delivering instructional units have been identified:

1) Off-campus class
2) Evening class
3) Radio course
4) Television course
5) Newspaper course
6) Correspondence course
7) Credit by examination
8) Intensive course
9) Short course
10) Telephone
11) Travel study
12) Internship

There are more ways of delivering instruction than those presented here: any number could be incorporated into the model.

The various costs incurred in the providing of instruction units have been identified as:

1) Development costs - The costs associated with the production and development of instructional units incurred by the various production agencies such as a telecommunication center, audio-visual services, radio production, etc.

2) Delivery costs - The actual costs of delivering the educational service, including such items as telephone costs, radio and television distribution costs, travel costs by instructors, etc.

3) Instructional costs - The salaries, related fringe benefits and supply costs allocable to instructional units at the time the instructional unit is being offered, such as teaching and grading costs.

4) Administrative costs - The salaries, related fringe benefits, and supply costs which directly support the instructional unit. These costs would include the salaries and fringe benefits of those persons who coordinate and administer the activity, such as the Director of Continuing Education, secretaries, registration personnel, and coordinators. Included also in this cost category would be promotion and publicity expenses.

5) Institutional costs - The costs associated with institutional overhead, such as the President's Office, Comptroller, Provost's Office, Board of Trustees, Vice-presidents, Central Business Office services, etc.

6) Student support costs - The cost associated with the various student support activities, including such services as counseling, registration, bursar, financial aid, etc.

7) Academic support costs - The costs associated with the various academic support functions if applicable, including computing services, library, audio-visual services, etc.

8) Facility costs - The costs of providing the instructional facility, including any rental fees, any percentages assessed by an outside vendor, any pro rata share of the building cost allocated by the institution, etc.

The third factor affecting the cost of the activity is level. For illustrative purposes I have identified six levels of instruction:

1) Non-credit
2) Non-degree credit
3) Continuing education unit
4) Lower division credit
5) Upper division credit
6) Graduate credit

Pictorially, we can represent the cost structure for providing a given level of instructional units as shown in FIGURE I. Each one of the cells contains cost data which is a function of level, delivery system, and cost categories required to develop, deliver, and support the instruction unit. The total cost of providing an instructional unit by a particular delivery system would be determined by adding across the cost categories. Algebraically if a_i = level of instruction.

FIGURE I

LEVEL OF INSTRUCTION = A

DELIVERY SYSTEM / COST CATAGORIES	Development Cost	Delivery Cost	Instructional Cost	Administrative Cost	Student Support Cost	Academic Support Cost	Facility Cost	Institutional Cost
Off-Campus Class	abc_{111}							
Evening Class								
Radio Course								
Television Course								
Newspaper								
Correspondence								
Credit by Exam								
Intensive Course								
Short Course								
Telephone Course								
Travel Study								
Internship								

b_j = delivery system and c_k = cost categories, and if cost data is

assigned to each cell, the cost associated with any given cell would be represented as $a_i b_j c_k$. The total cost of providing a_i level of instruction using delivery system b_j would be computed as $a_i b_j c_1 + a_i b_j c_2 + \ldots + a_i b_j c_8$. To determine the total cost of providing all a_i level of instruction by all delivery systems the formula would be:

$$a_i b_1 c_1 + a_i b_1 c_2 + \ldots + a_i b_1 c_8 + a_i b_2 c_1 + a_i b_2 c_2 + \ldots + a_i b_{12} c_8$$

or: $\sum_{j=1}^{12} \sum_{k=1}^{8} a_i b_j c_k$.

Similarily, the cost associated with all levels of instruction would be determined as follows:

$$\text{Total cost} = \sum_{i=1}^{6} \sum_{j=1}^{12} \sum_{k=1}^{8} a_i b_j c_k.$$

The effective use of this model depends on the accuracy and validity of the cost assigned to each of the cells. This model assumes a great deal of sophistication on the part of the institution to collect and report financial data. This model also presents various cost allocation problems. For example, Purdue University has estimated that it takes $30,000 to produce and develop a single T.V. course. How can we assign development cost for a T.V. course? Obviously certain standard costing procedures would have to be developed. For example, one could set the useful life of a T.V. course to be three years. The assumption here is that at the end of three years the course is obsolete. Assuming that the course is offered once each semester, then the development cost assigned for the course would be $30,000/6 or $5,000. The final determination of whether or not the course should be developed depends on the number of students to be served. The greater the number of students, the less the per-student cost.

Another allocation problem is assigning student and academic support costs. As was pointed out earlier, assigning these costs on an FTE basis may not be appropriate since these costs are more a function of the total number of students than their FTE. The cost incurred by the bursar or the registrar is the same for a part-time student as it is for the full-time one. Depending on what delivery system is used, assigning library cost may or may not be appropriate. Assuming these allocation problems can be solved and that the institution is capable of collecting the financial data required for this model, institutions would have the ability to cost compare various delivery systems. For example, if it were determined either through an institutional analysis of potential enrollments or mandated by an external source that there was a need to provide an off-campus graduate education degree, this model could be used to cost justify the appropriate delivery system to be utilized to meet the educational need.

The usefulness of this model would be greatly enhanced if equivalency relationships between the levels of instruction were developed. At the present time most funding formulas for state institutions are either based on credit hours or contact hours. In the area of non-traditional education, neither one of these measures is appropriate, first because in many non-traditional programs credit is not awarded and second, when T.V., correspondence, radio, or similar delivery systems are used, the concept of contact hours has no meaning. What is needed is another standard of measurement. In this I will call the standard a learning unit. Each level of instruction would be measured in terms of this unit. Per-learning-unit costs can be determined by taking the total costs associated with a specific level of instruction delivered in a specified

way and dividing this total cost by the number of learning units generated. For example, 1 graduate credit hour might equal 10 learning units, 1 continuing education unit might equal 5 learning units, 1 hour of non-credit instruction might equal 1 learning unit, and so on. Once a standard learning unit has been developed, we can cost compare the various levels of instruction by delivery system. This information may be used to justify state funding for the various levels of instruction according to delivery system.

If more detailed cost information were required, other dimensions could be added to the existing model. For example, if the model were adopted by a state board of higher education, another factor affecting the cost of providing instruction is the type of institution, such as two-year college, four-year college, university, etc. Since these institutions have different cost structures, state agencies could use this model to cost-justify selecting one institution over another to provide a specific type of instructional unit. If X_L = Type of Institution, then the cost of providing a given level of instruction a_i through delivery system b_j would be:

$$X_L a_i b_j c_1 + X_L a_i b_j c_2 + \ldots + X_L a_i b_j c_8$$

or:

$$\sum_{k=1}^{8} X_L a_i b_j c_k .$$

By dividing this total by the number of learning units generated, an average per learning unit cost for this specific type of institution is developed. A similar process completed for another type of institution would more than likely yield a different per-learning-unit cost. Assuming that there are no quality considerations, then it would appear that the institution with lowest per unit cost would be the most cost effective of instruction.

Besides the fact that implementation of this model requires a great deal more sophistication in cost accumulation procedures than currently is available in most institutions of higher education, this model says nothing about quality of programming or the efficiency of institutions in the utilization of its resources. At the present time measures of quality and efficiency are not available; therefore the final decision on whether or not learning units meet some standard of quality is left up to the judgment of the decision makers. Another limitation of this model is that it does not consider marginal cost, i.e., the increase in total cost of providing instruction caused by the production of one additional learning unit. The lack of marginal cost data does not allow one to examine the phenomenon of economies of scale which certainly operate in education.

The purpose of this paper was to present a model for costing non-traditional types of instruction. It is my contention that as the clientele programs and services offered by institutions change, models such as these will be needed to assist in the sound management of the institution. With this incentive, the techniques and allocation procedures required by this model will be further developed from their present state. Based on the projections of enrollments and future education needs, it appears that much more emphasis must be placed on the management and delivery of non-traditional forms of education.

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